# The Relation Between Binge-Watching and Snacking Behaviour: An Experience Sampling Study

Bachelor Thesis

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## Abstract

**Background:** Binge-watching video-on-demand (VoD) content is a habit that became more popular over time. Previous research suggests that snacking behaviour might be positively correlated with binge-watching, meaning that individuals who binge-watch are likelier to eat more (unhealthy) snacks. This could lead to serious health impacts in the long term (e.g. obesity or heart diseases). Besides, emotional stability might moderate the previous relation. Thus, this study aims to explore the relation between binge-watching and snacking behaviour over time.

**Methods**: To investigate the relations between the variables, an experience sampling study was conducted. 74 participants used the app Ethica for a period of two weeks to answer daily questions regarding their VoD watching and snacking behaviour. At the start, the trait emotional stability was measured once. For the analyses, several linear mixed models were used to analyse both overall and disaggregated between- and within-person associations between binge-watching and snacking over time and the moderating role of emotional stability.

**Results**: It was found that there was no significant overall relation between binge-watching and total snacking ($p=.274$) or unhealthy snacking ($p=.848$). Instead, a follow-up analysis investigating the associations between-person and within-person showed that binge-watching and general snacking was significantly associated in the opposite direction both at the between- as well as the within-person level, i.e. watching more than others as well as watching more than the personal average leads to consuming snacks less frequently in total. For unhealthy snacks, it was found that the association at the within-person level was not significant, whereas the between-person level significantly pointed at the expected direction, meaning that more watching leads to more unhealthy snacks ($p=.018$). Emotional stability did not moderate the overall associations between total snacking and unhealthy snacking ($p=.094$ and $p=.103$, respectively).

**Discussion:** The findings contradict previous research. The analyses showed that binge-watching was not significantly associated with unhealthy snacking over time. Instead, the finding that the association between general snacking and binge-watching pointed at the opposite direction suggests that binge-watching might have less severe impacts on snacking behaviour than expected. Follow-up research should further investigate the relation between snacking and binge-watching to clarify the contradicting findings and gain deeper insights.



**Keywords:** binge-watching, experience sampling, VoD watching, snacking behaviour, snacks

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# 1. Introduction

Over the past decades, on-demand video services have become more popular. Streaming services as Netflix, Amazon Prime and Youtube have great success in many countries, especially among young adults. Opposed to regular broadcasting TV, streaming platforms provide low costs access to a wide range of series, movies and documentaries that are constantly available without waiting times (Flayelle et al., 2020). Additionally, paid streaming services do not include commercials as opposed to regular TV. Often, streaming services upload a whole season of a series at once in contrast to regular TV shows. In addition, only a working internet connection is needed to stream and the most common on-demand services offer various options to access the products, such as via app or website, and have several options for subscriptions to fit the needs of the user. In Europe, more than 47 million people are currently signed up for Netflix and by 2024 this number is expected to rise to almost 63 million (Digital TV Research, 2021). In Germany, the number of users watching videos via streaming services rose from five million in 2014 to 13.4 million in 2019 (FFA, 2020). These numbers clearly show the attractiveness of on-demand video services.

Given the growth in prevalence and popularity of streaming services, *binge-watching* also becomes an increasing phenomenon among users. Generally, binge-watching refers to extreme consumption of audio-visual content such as watching entire seasons of a series at a time (Trouleau et al., 2016). However, it must be noted that there is no universally accepted definition for research on binge-watching. Various studies differ in their operationalisation of binge-watching. Mostly, the act of watching several episodes of a series or watching several hours at a time is referred to as binge-watching. However, this can lead to inconsistencies since the lengths of episodes of various series differ. Still, most studies use the definition of watching multiple ($\geq 2$ or $\geq 3$) episodes at a time (Flayelle et al., 2020; Starosta & Izydorczyk, 2020). A systematic review of binge-watching studies reported that on average around 72% of video-on-demand watchers engage in binge-watching, implying that binge-watching is rather the norm than an atypical watching practice. This was computed as an average prevalence based on many studies that analysed the prevalence of binge-watching among users. Most studies used general criteria to assess the prevalence as frequency per month or week, the duration per session or the number of episodes watched (Flayelle et al., 2020). Strikingly, young users explicitly stress the attractiveness of streaming services due to the possibility of engaging in binge-watching (Rubenking & Bracken, 2018). For instance, Netflix stated that 61% of their subscribers engage in binge-watching on a regular basis (Rubenking & Bracken, 2018). Based on these numbers

and indications, the phenomenon of binge-watching is also receiving increased research interests.

Next to the inconsistent conceptualisation and the high prevalence of binge-watching, the mere term is often negatively connotated due to similar other terms that describe addictive forms of behaviour (e.g. binge-eating or binge-drinking). Basically, the term 'binge' refers to an undesirable behaviour that is acted out in an excessive way. Existing literature already created a link between high engagement in binge-watching and a high likeliness of experiencing other dependency issues (Shim & Kim, 2018). Nevertheless, due to the novelty of the topic, it is questionable to immediately equate binge-watching with the abovementioned forms of excessive behaviour. It might be the case that binge-watching also has positive implications as opposed to common beliefs. In addition, research also highlights that binge-watching is not as negatively seen as other forms of excessive behaviour, i.e. having more social acceptance (Shim & Kim, 2018). Therefore, Rubenking and Bracken (2018) describe how some authors use the term 'media marathoning' as a more neutrally connotated synonym to binge-watching.

According to literature, people engaging in binge-watching themselves mostly expect positive outcomes. Firstly, using video streaming services is one of the most popular free-time activities. Viewers expect binge-watching to result in positive emotions and entertainment (Starosta & Izydorczyk, 2020). Thus, referring to a state of relaxation during watching times. Moreover, it is described that people engage in watching series to discuss the content of a series with social contacts (e.g. friends). Thus, a positive social outcome is suggested (Starosta & Izydorczyk, 2020). Furthermore, Granow et al. (2018) stress how the engagement in binge-watching reinforces autonomy by being able to independently determine one's free time activity. This finding stresses the importance of freedom in decisions as to why binge-watching may have positive outcomes. Interestingly, Shim & Kim (2018) describe how users engage in binge-watching to compensate negative emotions with positive ones, resulting in a balance of emotions. Lastly, it also is used as a way to escape boredom in free time, i.e. merely passing time (Flayelle et al., 2020). Based on these findings, binge-watching seems to be correlated to several positive effects.

Despite these positive expectations by viewers themselves, several studies have suggested that binge-watching can result in several negative mental and physical health consequences. Starting with sleep behaviour, binge-watching has been reported as negatively influencing sleep quality, even leading to insomnia and daytime fatigue (Flayelle et al., 2020). Several online self-report studies among adults indicated that users engaging in heavy binge-watching are more likely to experience insomnia symptoms. Exelmans and van den Bulck

(2017) argued that a possible explanation is that binge-watching as a new style of viewing might be a hazard for the overall sleep quality due to a rise in arousal while watching. Moreover, binge-watching has also been correlated with psychopathological symptoms, for example, anxiety, depression, addiction behaviour and excessive high usage of the internet (Flayelle et al., 2020; Starosta & Izydorczyk, 2020). However, systematic reviews describe how these outcomes might not be very conclusive as there are mixed results. Whereas some studies illustrate a positive link between binge-watching and depression, others highlight how binge-watching is not intrinsically pathological, i.e. linking binge-watching to depression, but that self-regulation issues might explain a relation between binge-watching and depression (Ahmed, 2017; Tukachinsky & Eyal, 2018). Given these mixed results, it is not yet clear if binge-watching is directly linked to pathological symptoms. In addition, Granow et al. (2018) mention in their online study with participants recruited from Facebook that binge-watching might result in feelings of guilt if individuals cannot fulfil their goals due to consuming too many episodes, i.e. using binge-watching as a form of procrastination. In sum, several studies already researched possible relations between binge-watching and negative mental and physical health consequences. However, the results should be interpreted with caution since there are mixed findings. Many studies are conducted online and participants are also often recruited via social media, such as Facebook (Granow et al., 2018). This might lead to one-sided answers that are not be possible to be generalisable, i.e. self-selection bias.

Another specific consequence that seems to follow binge-watching is unhealthy diet behaviour. According to literature, especially unhealthy snacking behaviour seems to be related to binge-watching. Generally, *snacking* is defined as 'eating between main meals and eating typical snack foods' (Eisenberg et al., 2016, p. 1). A recent study revealed that most of the food consumed during watching shows were snacks which were also more likely to be unhealthy. Generally, eating snacks is no negative habit since it can also be correlated with the choice of more healthy foods as well as more variety in food intake (Hartmann et al., 2012). However, snacking behaviour might result in skipping (healthy) main meals or having a calorie intake that is too high, leading to overweight over time. In the long run, this form of snacking behaviour has detrimental consequences for the health of individuals, potentially resulting in serious diseases, for example, heart diseases, obesity or metabolic issues (Mithra et al., 2018). This is the case as many snacks usually contain high percentages of salt, sugar and fat. The nutritional values of unhealthy snacks are also often correlated with a lower energy level of individuals (Hartmann et al., 2012).

Several studies specifically support the notion of a possible relation between snacking and binge-watching. One study concluded that snacking behaviour might be affected by general entertainment media such as TV or streaming services (Eisenberg et al., 2016). Another study by Chapman et al. (2012) highlights that television watching is positively correlated with exorbitant eating, facilitating obesity. A third study also supported this finding by stressing that specifically binge-watching leads to reduced healthy eating and simultaneously diminished physical activity (Vaterlaus et al., 2019).

Given these serious potential consequences of binge-watching for unhealthy diet behaviour, it should be examined which predictors facilitate binge-watching. Research already identified several predictors of excessive consumption of movies and series, namely individual situational factors and personality traits. According to Merrill Jr. and Rubenking (2019), individual situational motives affect the adoption of binge-watching. Especially using binge-watching as procrastination is an important predictor, as well as the extent to which users regret the engagement in binge-watching meaning if people feel more regretful, they are less likely to engage in binge-watching. The last individual situational factor indicated by Merrill Jr. and Rubenking (2019) is the notion of experiencing reward by engaging in binge-watching.

In addition to the individual situational factors, several studies have specifically examined whether various personality traits are predictive of binge-watching. In the foreground are the five overall personality traits of the Big Five, a personality trait model with the following personality traits: Openness, Conscientiousness, Extroversion, Agreeableness and Neuroticism (Starosta et al., 2020). All of these were already used in some studies as predictor variables. For instance, individuals that score high on neuroticism are suggested to be more likely to engage in binge-watching since neuroticism focuses on feeling more negative emotions, being impulsive and having issues coping with problematic situations (Starosta et al., 2020). It might be the case that individuals scoring high on neuroticism are trying to cope with everyday problems by engaging in extreme binge-watching as heavy binge-watchers are also more likely to engage in maladaptive coping (Flayelle et al., 2020).

One of the specific facets of neuroticism is *emotional stability*. According to Starosta et al. (2020), emotional stability describes 'the level of emotional reactivity and tolerance to frustration and stress' (p. 4). This means that people who score low on emotional stability, i.e. being emotionally unstable, are more likely to have issues coping with frustration and stress. In addition, being emotionally unstable seems to be correlated with emotional coping (Carlo et al., 2012). In contrast to the more efficient ways to handle issues in problem-focused coping, emotional coping mainly deals with improving the psychological state of the individual while

neglecting the actual issue. As engaging in binge-watching seems to be correlated with experiencing more negative emotions like dependency or loss of control, the variable emotional stability may be a relevant predictor in the context of engaging in binge-watching (Anozie, 2020; Flayelle et al., 2020).

Furthermore, emotional stability as a personality trait seems to be related to eating behaviour as well. Generally, the experienced emotions of a person are often correlated with eating. For instance, some individuals tend to use food as a way to cope with negative emotions, i.e. emotional eaters (Levitan & Davis, 2010). However, another study found that emotional eaters are not more likely to consume snacks than non-emotional eaters, but that snacking is better predicted by general habits of snacking and forms of restraint eating (Adriaanse et al., 2011).

Given these contrasting findings in the relation between emotional stability and eating behaviour, more research is needed. In addition to the variable's potential role as a direct predictor of snacking and binge-watching, it could be the case that emotional stability moderates the relation between eating behaviour and binge-watching. This suggestion is derived from the idea that emotional stability might be related to specific ways of coping and feelings of emotions that might further affect the decisions of individuals concerning binge-watching and snacking behaviour. For instance, it might be the case that the association between excessive consumption of unhealthy snacks during binge-watching is stronger for those that are more emotionally unstable. To date, however, no studies have simultaneously examined the relation between binge-watching, snacking behaviour and emotional stability.

Moreover, there are some limitations of previous research on the consequences of binge-watching. Firstly, the existing studies mostly used cross-sectional (online) surveys which might result in disadvantages, such as recollection errors, low response rates or self-selection bias (Wright, 2017). In addition, the described studies varied in their conceptualisation of the term binge-watching, making it difficult to compare the findings of studies. Next, some of the studies on snacking behaviour during binge-watching did not exclusively focus on streaming services but included TV watching as well. It is not completely clear if this affects the findings. Lastly, it has been suggested that many binge-watching studies use a confirmative approach to prove negative or positive associations since some studies only included very favouring or very negative variables (Ahmed, 2017; Shim & Kim, 2018). This might lead to biased results. Due to the limitations of previous research and the lack of research regarding the relation between snacking behaviour and binge-watching and the potential moderating role of emotional stability, it is important to further study the correlation between the three described variables.

A study design that can overcome some of the abovementioned limitations is the *Experience Sampling Method* (ESM). Experience sampling can be described as a method that focuses on recording activities or emotions over a specific time frame (Scollon et al., 2009). This means that participants track over a time period certain aspects of their daily lives by a systematic self-report at random time points (Larson & Csikszentmihalyi, 2014). The advantage is that people can be very specific about their current activity or feeling, as opposed to other study designs such as cross-sectional surveys. Another benefit of the method is that participants are located in their natural environment which enables a more precise image of the actual behaviours and feelings of participants (Van Berkel et al., 2017). The detailed information of participants over a time frame helps to better analyse patterns in behaviour or feelings as well as reducing the effects of memory biases. The study method could give very detailed insights in peoples' snacking behaviour during binge-watching over time. Monitoring individuals' patterns over time might help to better understand the relation between the two variables as they actually occur in daily life, as opposed to other study designs such as retrospective surveys. This is the case since Experience Sampling does not rely on a single measurement point but adopts repeated measurements in the daily lives of individuals which increases the ecological validity (Larson & Csikszentmihalyi, 2014; Verhagen et al., 2016). In addition, the repeated measurements allow monitoring variances in the relation of the variables that might be important to better recognise changes in behaviour over time (Verhagen et al., 2016). It might be the case that these benefits could help to move forward the research on binge-watching due to increased reliability and validity.

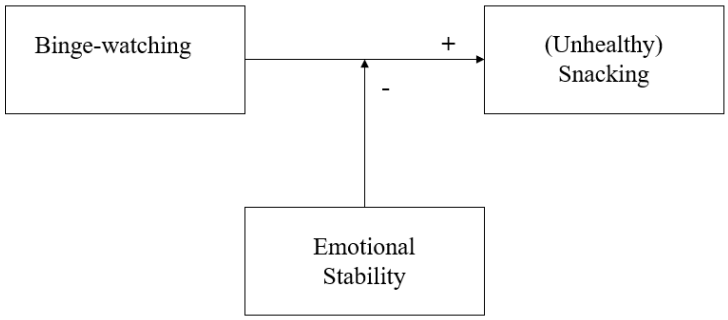
Additionally, an intensive longitudinal study design as ESM allows analysing different types of associations. In particular, the disaggregation of within-person and between-person effects can be investigated due to having a time-varying covariate (Curran & Bauer, 2011). Whereas the between-person effect is mostly studied in psychological research, the within-person effect is often neglected since longitudinal designs are needed for this and they are less often used in published literature (Curran & Bauer, 2011). For instance, the between-person effect might describe that if an individual is watching more series than others on average, the specific person is also more likely to eat snacks. In contrast, the within-person effect focuses on what happens with a person's individual snacking behaviour when they watch more or less than they usually do (i.e. than their own average). Analysing both levels of effects allows gaining a deeper understanding of the relation between variables since these two types are often not in agreement (i.e. being non-ergodic). For instance, between-person analyses can often not be generalised to within-person findings. It might also be the case that the two types of

associations could point in the opposite direction, making the overall association non-significant.

The current study used ESM to examine the relation between individuals' amount of binge-watching and snacking behaviour over time. Additionally, the potential moderating role of emotional stability as a personality factor was investigated (see figure 1). Therefore, this research focuses on three research questions. The first question deals with the relation of snacking behaviour and binge-watching: '*To what extent is binge-watching related to snacking behaviour over time?*'. The second question investigates the types of associations: '*Is the association between binge-watching and snacking different at the between-person vs. the within-person level?*'. Lastly, the third question incorporates the third variable, namely emotional stability: '*To what extent is the overall relation between snacking behaviour and binge-watching moderated by emotional stability?*'.

**Figure 1**

*The Expected Effects of Binge-Watching and Emotional Stability on (Unhealthy) Snacking*




## 2. Methods

### *2.1 Design*

An ESM study was used to answer the formulated research questions. The present study belonged to a broader research project focusing on binge-watching and its predictors and consequences. Therefore, several questions were integrated into the questionnaires of the joint data collection that are not directly relevant for the three research questions. On the 23rd of March, the study was approved by the Ethics Committee at the University of Twente (Case number: 210327).

The data collection took place for 15 days as Experience Sampling is most frequently conducted over two weeks since a longer time period might contribute to an excessive burden

for the participants and too much missing data, leading to technical issues (Conner & Lehman, 2012; Van Berkel et al., 2017).

The data collection phase started on the 8th of April 2021 and ended on the 22nd of April (see table 1). In total, each participant received 30 questionnaires. The type of sampling was interval contingent sampling. This form of sampling asks participants to answer questions regarding their current mood, behaviour and feelings in a fixed and repetitive time interval (Wheeler & Reis, 1991). Interval contingent sampling is also used when it is of interest what has happened in the time before the set interval which is also applicable for this study. Two points in time per day were chosen as the aim was to minimise the burden for participants as much as possible. Besides, researchers found that the response rates for interval contingent sampling with one or two measurement points per day are among the highest, i.e. around 95%, supporting the choice of two points in time per day (Conner et al., 2003). In this study, the intervals were set between 8 am and 12.30 pm and 6 pm and 12 am. The notifications were sent at 8 am and 6 pm meaning that there were no random times. The asked questions were exclusively presented in the same order. This might help to reduce the time participants need to answer the questionnaires since they get used to the questions.

**Table 1**

*The Schedule of the Study for all Days With Mentioned Relevant Variables, Points in Time, Notifications and Expiry Date per Questionnaire*

| **Day** | **Questionnaires** | **Relevant variables** | **Points in time** | **Expiry time** | **Notifications / reminders?** |
|---|---|---|---|---|---|
| 8th April | Demographics | All | 8 am | No | One |
| | Baseline questionnaire | Emotional stability | 10 am | No | One |
| 9th April – 22nd April (14 days) | Morning questionnaire | VoD watching and snacking | 8 am | Yes (4.5 hours) | Two |
| | Evening questionnaire | / | 6 pm | Yes (6 hours) | Two |

*2.2 Participants*

The participants for the study were selected by non-probability convenience sampling. People in the social environment of the researchers were asked if they were willing to participate. The advantages of using this sampling method were the simplicity as there are no strict guidelines and no inclusion criteria for the sampling process, the thriftiness and a relatively short period of data collection (Business research methodology, n.d). To be included in the study, participants needed to have a suitable (mobile) device and an e-mail address to fill out the questionnaires provided digitally per day. Moreover, as the questionnaires were presented in English, the participants needed to sufficiently understand English. Lastly, it was indicated that participants needed to be at least 16 years old.

Participation in the study was voluntary and the participants could withdraw from the study at any time without providing a reason. At the beginning of the study, every participant needed to sign a digital informed consent. Participants did not receive any training or feedback before or during the data collection. Typical for ESM, daily notifications were used to enhance the compliance of participation. Regarding the sample size, Van Berkel et al. (2017) argued that most ESM studies have relatively small sample sizes. They also estimated a median of 19 participants in previous ESM studies, whereas the mean equalled 53 participants. In addition, Conner and Lehman (2012) mentioned that research which focuses on associations needs fewer participants than other research topics. Thus, the study aimed for a sample size comparable to the mean sample size reported by Van Berkel et al. (2017).

*2.3 Procedure*

The app 'Ethica' was used to measure participants' moods, feelings and behaviours on a longitudinal basis. Participants were asked to download the app 'Ethica', create a participant account and send the mail address they used to one of the researchers.

A day before the start of the study, the participants received an email with some general information regarding the purpose of the study as well as the registration code to start the study (see Appendix A). When the participants opened the app for the first time and typed in the registration code, an informed consent was shown which the participants had to agree with. The consent form also included information regarding anonymity, withdrawal or emerging questions (see Appendix B).

During the data collection, participants had to fill in the same two short questionnaires every day after receiving a notification except for the first day where a larger baseline questionnaire was provided as well as a questionnaire concerning the demographics. To fill out

the daily morning questionnaire, around three minutes were estimated and for the evening questionnaire around two minutes were estimated. The baseline questionnaire was assumed to take ten minutes and the needed time for the demographics was estimated at around three minutes. These two questionnaires, i.e. baseline questionnaire and demographics were given on the first day without an expiry time, meaning that participants could decide for themselves when in the course of the two weeks they wanted to fill out the two questionnaires. The next 14 days were filled with the repetitive morning and evening questionnaires leading to 15 days of data collection in total.

In the morning, daily snacking behaviour was measured once for the snack consumption of the previous evening with two self-created items whereas emotional stability was conceptualised as a stable trait and only collected at the baseline questionnaire, as literature suggested that personality traits are rather stable over time (Baumeister & Twenge, 2001). In addition, participants were asked each day if they were engaged in VoD watching the previous day. Participants received daily notifications at fixed times to be reminded to fill out the questionnaires. In the morning, participants received the questionnaire and the first notification at 8 am. If participants did not fill out the questionnaire immediately, a reminder was sent after 135 minutes. After 4.5 hours of not filling out the questions, the questionnaire disappeared. In the evening, the questionnaire and the first notification appeared at 6 pm and the second reminder was sent after three hours. The questionnaire was removed after six hours of not filling out the questions. At the end of the data collection, the participants received a last email where they were thanked for their participation.

### *2.4 Measurements*

Throughout the study, daily questionnaires were provided as well as a baseline questionnaire and a questionnaire focusing on demographics on the first day of data collection. The demographic questionnaire covered the background of the participants and asked for gender, age, occupation, nationality and the used streaming services. The baseline questionnaire focused on measuring personality traits or other psychological constructs. For this research, only the items for emotional stability were relevant but other constructs such as loneliness, motivation, the fear of missing out and procrastination were included as well.

The construct of emotional stability was measured with a ten-item scale from the International Personality Item Pool (IPIP) having an alpha of .86 (Goldberg et al., 2006). Often, personality traits are assessed with an extensive questionnaire. However, to minimise the time participants needed to answer the baseline questionnaire, a shorter scale was implemented (see

Appendix C). A 5-point Likert scale from "*very accurate*" to "*very inaccurate*" was used to assess how well the item described the participants. For instance, the item 'I get stressed out easily' is one of the included statements. Generally, the maximum score obtained was a 5 whereas the lowest score was a 1. The scale consists of two positively keyed items and eight negatively keyed items. For the former, the answer option '*very inaccurate*' is assigned a value of 1 and the option '*very inaccurate*' receives a 5. For the latter, the scoring system is vice versa. Afterwards, all items are summed up and divided by the total number of items (i.e. 10). Having a high score was more likely to be associated with being emotionally stable. Cronbach's alpha of the ten items in the current study was high (.869), confirming a high internal consistency.

Each morning questionnaire started with questions regarding video-on-demand watching (see Appendix D). Therefore, four questions were asked. Firstly, it was asked whether people were engaged in video-on-demand watching yesterday and, if yes, they were asked to indicate the time (in hours) spent watching. Options were given between 'less than 1 hour' to 'more than five hours'. If this was not applicable, the participants could choose the option 'I did not watch'. The time of watching movies and series was combined as the distinction of both was not relevant for this research. Next, they were asked to fill out the number of episodes/movies watched. Then, it was asked when the participants started to watch. Therefore, the participants could choose between morning, afternoon, evening and night. Lastly, it was asked why the participants engaged in video-on-demand watching, i.e. the reasons.

After the questions focusing on video-on-demand watching, other questions concerning behaviour the previous day and their current mood and feelings were asked. For this research, only the two questions regarding their snacking behaviour were relevant (see Appendix E). Snacking behaviour of the previous day after dinnertime was measured with the item '*Did you eat a snack yesterday after dinnertime?*'. The options 'yes', 'no', and 'I cannot remember' were given. After dinnertime was used as time period since it was assumed that it might be difficult to remember all snacks eaten during the whole day and that most people eating snacks in the evening combine that with watching series. In addition, the question regarding their starting point of watching series could be used to control this assumption. The second question focused on the types of snacks consumed. The item used was '*If you ate a snack yesterday during the evening, which type(s) of snack(s) did you eat?*'. The participants could select various categories of healthy and unhealthy snacks. The options for unhealthy snacking were 'chocolate, candy, cake, ice cream or something similar' and 'chips, flips or something similar'. In contrast, the options for healthy snacks were 'fruit, vegetables or something similar' and 'crackers, nuts,

yoghurt or something similar'. There were also other options such as 'I cannot remember', 'Other' or 'I did not eat a snack'.

*2.5 Data analysis*

The data was transferred to SPSS (Version 27) to conduct the analyses. Participants with insufficient response rates needed to be excluded from the data set via a cut-off point. Based on Van Berkel et al. (2017), the average ESM studies has a response rate of 69.6%. Therefore, it was decided to exclude participants who answered less than 70% of the questionnaires. Additionally, most of the participants (81.48%) answered more than 80% of the surveys indicating that it is acceptable to exclude responses with less than 70%.

For the categories of snacking, a dichotomous dummy variable was created. All unhealthy snacks were coded as 1 and the healthy snacks were coded as 0. If participants indicated that they consumed healthy as well as unhealthy snacks a 1 was coded since it was assumed that it is not possible to compensate unhealthy snacks with healthy ones. The options 'I cannot remember' and 'I did not eat a snack' were coded as 0. The coding for the option 'Other' varied. If the option was combined with an unhealthy snack, it was coded as a 1. The opposite happened if it was combined with a healthy snack. If the option 'Other' was solely chosen, the coding was based on the previous snacking behaviour of the participant. If an individual ate most days unhealthy snacks, a 1 was coded and vice versa. However, the option was seldom chosen.

Next, VoD watching amount was recoded into a binge-watching variable. Instances of three or more episodes in combination with two or more hours of watching were coded as binge-watching based on the definition by Rubenking and Bracken (2018) who described binge-watching as watching three or four episodes that are at least 30 minutes long. Since the answer options did not distinguish between half hours, two hours were used as the cut-off point. The continuous episodes variable and the hours variable were used to visualize watching patterns over time. Therefore, concerning the hours variable, the answer option 'less than 1 hour' was recoded into 0.5 to choose a middle way within one hour. All other answer options could be coded normally such as 1 for one hour.

Participants' demographics were analysed via descriptive statistics. Moreover, the daily VoD variables, namely hours watched, episodes watched and day times were visualised by graphs to monitor the general watching behaviour over time. It was also analysed if most people engage in the evening/night time in VoD watching. This was studied to explore the assumption

that snacking behaviour combined with VoD watching would indeed mainly happen in the evening/night time.

To conduct all statistical analyses, a series of linear mixed models (LMMs) was used. This allowed adequate handling of the remaining missing data. Besides, LMM can deal with the (multilevel) dependencies of responses within individual participants (Yang et al., 2014). For each model, the time variable (14 days) was used as repeated measurement and the participants' ID was set as subject variable. Since it was assumed that correlation between measurements within participants decreases over time, the autoregressive covariance structure AR(1) was used to model the repeated measurements. For all variables, z-scores were calculated to obtain standardised regression estimates in the LMMs. An alpha of 0.05 was used as significance level. The estimates were interpreted by using Cohen's conventions (1988). Hence, an effect size of .10 is considered as weak association, .30 as moderate and .50 as strong.

To test the association between binge-watching and snacking behaviour, first, the variable focusing on general snack consumption ('*Did you eat a snack yesterday?')* was set as dependent variable while the binge-watching variable was considered as fixed factor. Next, the same analysis was done with the dummy-coded variable for unhealthy snacking as dependent variable.

Additionally, the within-person and the between-person associations were disaggregated to analyse the associations in more detail (Curran & Bauer, 2011). Since this analysis requires a continuous variable or an ordinal variable with several categories, the hours of VoD watching variable was used instead of the computed binge-watching variable. Based on this variable, a person-mean and a person-mean centred score for hours watched were separately created. The person mean score can be seen as the baseline or average score per person whereas the person-mean centred score is the individual time-dependent score. As dependent variable, general snacking was used and in a second analysis the dummy variable concerning the types of snacks. The person-mean and the person-mean centred variables were set as fixed covariates whereas the snacking variables were the dependent variables.

For the third question, the moderator variable emotional stability was included and a moderation analysis was conducted with the snacking variable as dependent variable and binge-watching, emotional stability and their interaction term as fixed effects. Additionally, the same analysis was done with the dummy-coded unhealthy snacking variable as dependent variable.

## 3. Results

### *3.1 Demographics*

In total, 81 participants were included in the study. After excluding participants with insufficient response rates (less than 70%), 74 participants remained for analysis. One of the excluded participants had a response rate above 70% but due to missing demographics, the person was excluded as well.

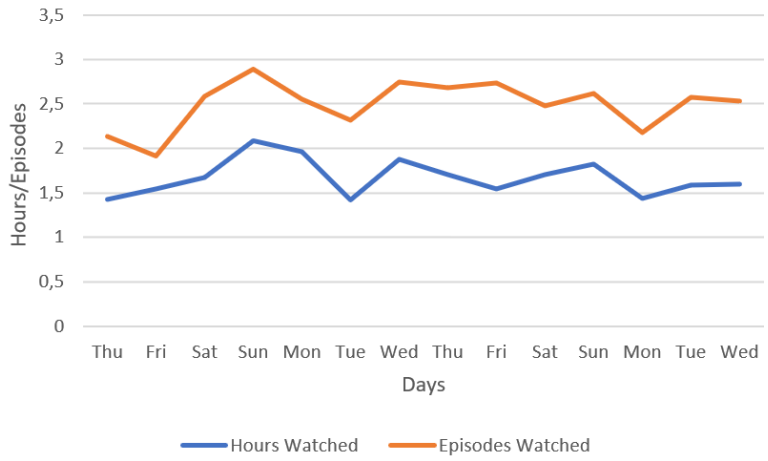
Out of the final data set, 61 females (82.4%) and 13 males (17.6%) took part ranging between 20 and 60 years ($M$ = 22.96, $SD$ = 5.51). Of the 74 participants, 57 were students (77%). The remaining 17 were either apprentices (8.1%), full-time employees (6.8%), part-time employees (4.1%), unemployed (1.4%) or something else but unspecified (2.7%). The sample mostly consisted of German participants: 70 people were German (94.6%), one person was Dutch (1.4%) and the remaining three were other European (4.1%). Most participants used more than one streaming service (93.24%) and almost all participants used Netflix as streaming service (94.6%). Amongst other options, Amazon Prime, Youtube or Disney+ were included.

### *3.2 Descriptive statistics*

The mean of hours watched per day varied between 1.42 and 2.09 hours (see figure 2). Focusing on the episodes watched per day, the average fluctuated between 1.91 and 2.89 episodes. During the first weekend, there seemed to be a peak in watched episodes and hours spent watching. This was not visible during the second weekend.

**Figure 2**

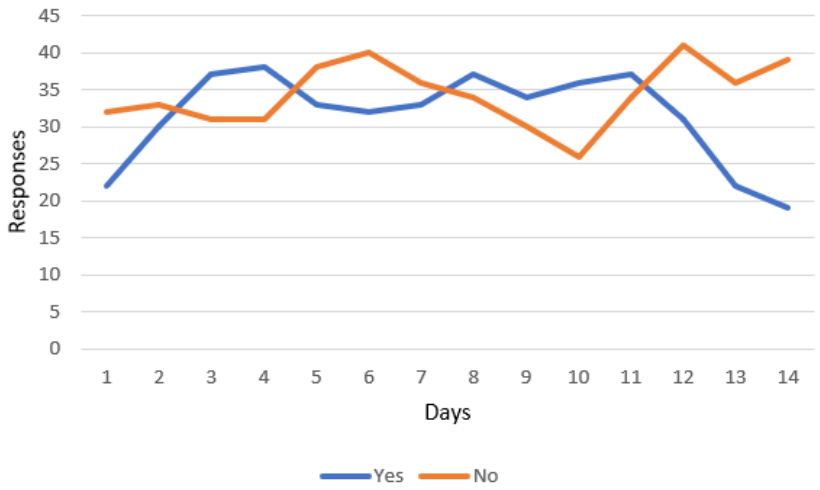
*The Estimated Marginal Mean Watching Behaviour per Day*



Focusing on the general snack intake, it was observed that participants eating snacks and not eating snacks were relatively equally distributed (see figure 3). The exception are the last days where more individuals did not eat a snack.

**Figure 3**

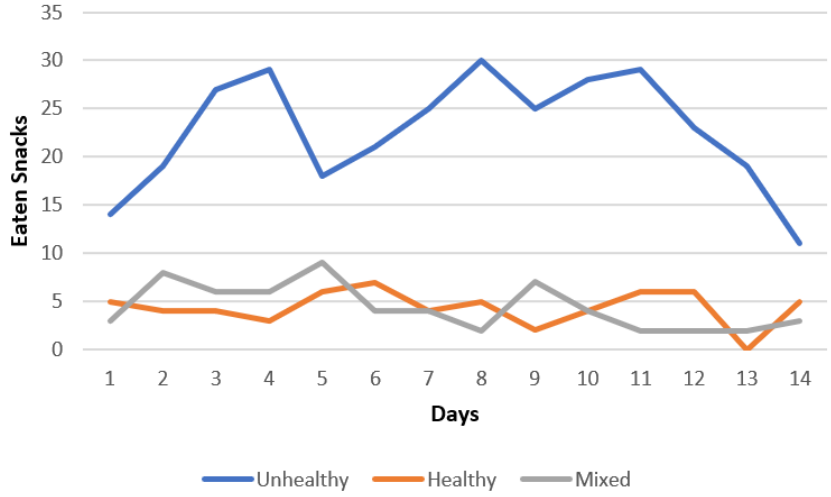
*The Evening Snack Intake per Day in Absolute Numbers*




At times a snack was consumed, the number of participants consuming only unhealthy snacks, combining sweet and salty unhealthy snacks, was much higher than those consuming healthy snacks or the mixture of both snacks (see figure 4). Over time, the snack intake indicated that more snacks were eaten at the weekend than during the week (here: days 3+4 and 10+11).

**Figure 4**

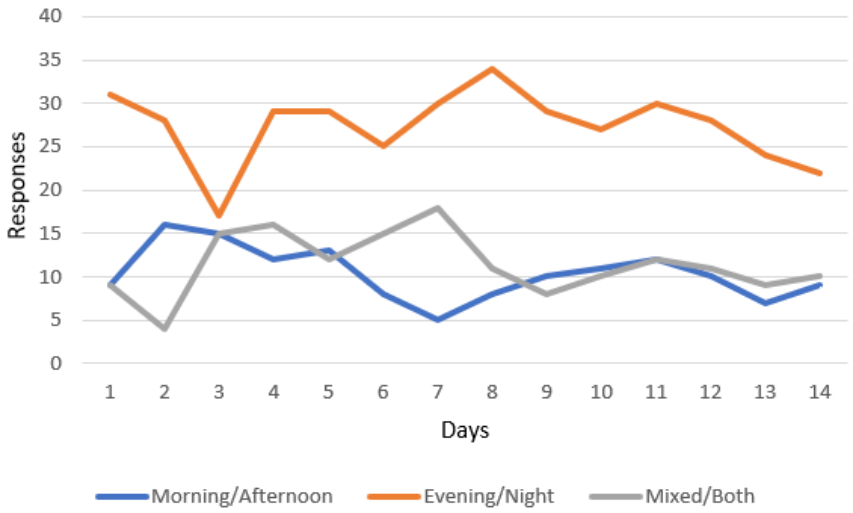
*The Distribution of Eaten Snacks per Day in Absolute Numbers*



On average, the distribution of watching times per day confirmed that more participants engaged in video-on-demand streaming during the evening/night than in the morning/afternoon (see figure 5). This supported the assumption that participants should only focus on snacks eaten after dinnertime since this was the time when most people were engaged in video-on-demand watching as well.

**Figure 5**

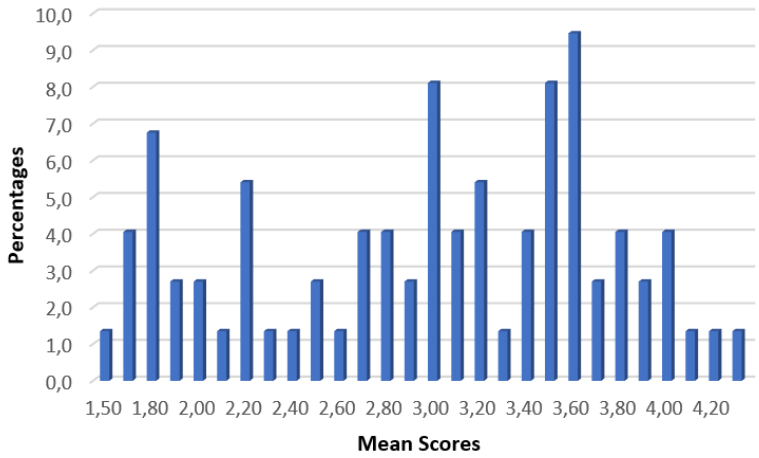
*The Distribution of Watching Time per Day in Absolute Numbers*




The trait scores varied widely between participants from 1.50 and 4.50 in a range of 1 to 5 ($M$ = 2.99, $SD$ = 0.74) (see figure 6). Still, the sample was mostly emotionally stable.

**Figure 6**

*The Distribution of the Mean Scores of Emotional Stability in Percentages*



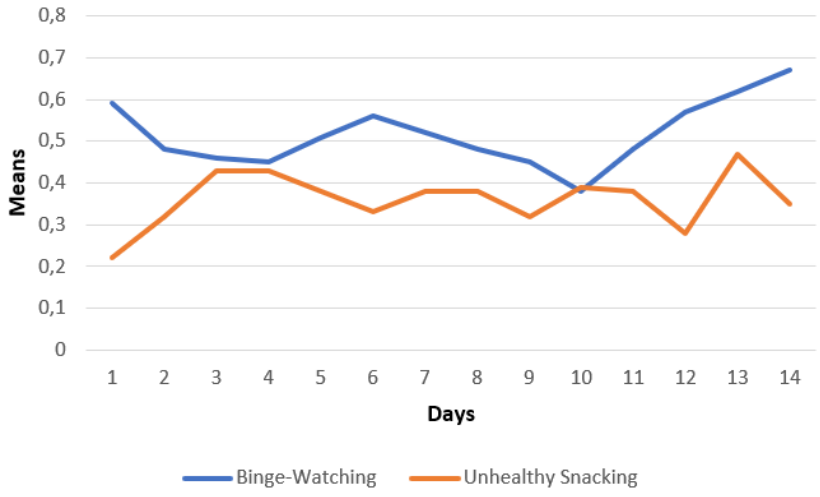
*3.3 Binge-watching and snacking behaviour*

No significant overall association between snacking and binge-watching was observed at the group level. Firstly, there was no significant relation between binge-watching and general snack consumption (β = .077, *SE* = .070, *F*(1, 885. 418), *p* = .274). There was also no significant relation between binge-watching and unhealthy snacking (β = -.014, *SE* = .071, *F*(1, 894.191), *p* = .848). The visualisation also illustrates the absence of an association between binge-watching and unhealthy snacking over time (see figure 7).

As a follow-up analysis, the associations between hours watched and snacking at both the between-person and within-person level were analysed. At both the between-person level (β = -.10, *p* = .006) and the within-person level (β = -.08, *p* = .019) hours watched and general snacking were significantly, but weakly, negatively associated. This indicates that people who watched more than others on average snacked less often than others over time. When people watched more than they usually did, they also snacked less often. The second analysis with hours and unhealthy snacking revealed that the between-person associations (β = .09, *p* = .018) had a significant positive effect that was weak in strength. The within-person association (β = .06, *p* = .067) turned out to be non-significant although it approached significance. These findings showed that participants who on average watch more than other participants snack unhealthier. However, if individuals watch more than they usually watch on average, there was no significant association with unhealthier snacking.

**Figure 7**

*The (Absence of) Association Between Binge-Watching and Unhealthy Snacking*



*3.4 Moderation by emotional stability*

No significant interaction effect was found for emotional stability on the overall relation between binge-watching and both general snacking and unhealthy snacking (see tables 2 and 3). The interaction effect between binge-watching and emotional stability indicated that the level of emotional stability did not affect the relation between binge-watching and whether or not snacks were consumed ($F(1, 901.543) = -.119$, $p = .094$). Also, the interaction effect between binge-watching and emotional stability did not affect the relation between binge-watching and unhealthy snacks ($F(1, 907.904) = .117$, $p = .103$). However, the main effect of emotional stability on unhealthy snacking was significant, meaning that being less emotionally stable was significantly correlated with eating more unhealthy snacks over time.

**Table 2**

*The Moderation Analysis for General Snacking With Standardised Values*

| | | | | | | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|
| Parameter | β Estimate | Standard Error | Df | t | Sig. | Lower Bound | Upper Bound |
| Intercept | -.036 | .060 | 571.516 | -.608 | .543 | -.152 | .80 |
| BW | .072 | .07 | 884.381 | 1.029 | .304 | -.065 | .21 |
| ES | .112 | .061 | 604.053 | 1.836 | .067 | -.008 | .232 |
| BW*ES | -.119 | .071 | 901.543 | -1.674 | .094 | -.258 | .02 |

*Note.* The abbreviation BW refers to binge-watching and ES means emotional stability.

**Table 3**

*The Moderation Analysis for Unhealthy Snacks With Standardised Values*

| | | | | | | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|
| Parameter | β Estimate | Standard Error | Df | t | Sig. | Lower Bound | Upper Bound |
| Intercept | .061 | .06 | 569.897 | 1.008 | .314 | -.058 | .179 |
| BW | -.007 | .071 | 892.063 | -.101 | .920 | -.147 | .132 |
| ES | -.132 | .062 | 602.895 | -2.129 | .034 | -.254 | -.10 |
| BW*ES | .117 | .072 | 907.904 | 1.632 | .103 | -.024 | .258 |

*Note.* The abbreviation BW refers to binge-watching and ES means emotional stability.

## 4. Discussion

In general, this study aimed to investigate the relation between binge-watching and snacking over time. It was found that there was no significant overall relation between binge-watching and both snacking in general and unhealthy snacks over time. However, deeper exploration revealed that the between- as well as the within-person association pointed at the opposite

direction of what was expected for general snacking. Focusing on unhealthy snacks, the within-person association was not correlated, whereas the between-person association pointed to the expected direction. Lastly, emotional stability did not moderate the previous relations although it was a significant and direct predictor for unhealthy snacking.

Firstly, it was examined whether there was a significant overall correlation between binge-watching and general snack consumption since it was assumed that watching would be positively associated with eating more snacks in the evening. For instance, Chapman et al. (2012) argued that excessive watching favours over-eating, potentially leading to obesity in the long term. However, against expectations and previous studies, the current study did not support this finding. It might be that the homogenous sample, consisting of students being highly educated, explains why no problematic relation was found. Devaux et al. (2011) argue that highly educated individuals are less likely to develop obesity due to health-related knowledge. It might simply be that the participants avoided snacking in the evening due to having knowledge about the implications of unconscious snacking during watching times.

Afterwards, it was studied whether there was a significant relation between binge-watching and unhealthy snacks. In literature, several researchers found that binge-watching leads to eating more unhealthy snacks in general (Hartmann et al., 2012; Mithra et al., 2018; Vaterlaus et al., 2019). However, these studies used cross-sectional study designs. The current finding contradicts previous research as there was no significant overall relation between binge-watching and unhealthy snacks. As most studies reported a significant relation, it was expected to find similar findings. Merely one other undergraduate project from the University of California found that there was no significant relation between binge-watching and diet habits (D'Anna & Moore, 2018). Still, a negative relation between binge-watching and unhealthy snacking predominates in research. However, one study showed that men are more likely to have appetite after watching movies (Mattar et al., 2014). Additionally, the study also supported that men are more likely to crave food with high fat opposed to women. This might be important since the present study mainly had female participants. A follow-up study could use gender as a potential moderator. To sum up, the study did not support the findings from literature, but there might be other factors affecting the relationship, such as gender, that were not considered.

Additionally, to investigate the relation in more depth, the within and between-person associations were analysed separately. In contrast to literature, the association-analyses even highlighted that the relation between the number of hours watched and general snacking behaviour pointed at the opposite direction. Hence, against expectations, it was found that individuals who on average watched more than others generally ate less frequently snacks. Additionally, if

participants watched more than they usually did, they also ate fewer snacks. Focusing on unhealthy snacking, however, the association between binge-watching and snacking revealed that individuals who watched more were also more likely to eat unhealthy snacks. However, if participants watched more than they usually did, they did not engage in eating more unhealthy snacks. Since the study showed that the relation between snacking and binge-watching pointed even at the opposite direction, it might cast doubts on previous studies arguing that binge-watching leads to more (unhealthy) snacking. The current finding suggested that binge-watching might be less bad for diet behaviours than expected. Flayelle et al. (2019) also highlighted that it is important to be cautious about over-pathologising binge-watching since it cannot be immediately equated with problematic binge-watching. Opposed to the stated consequences in literature, the findings showed that more watching was indeed associated with less general snacking. However, the analyses also showed that heavy watchers did consume more unhealthy snacks which was expected by literature. Since this finding was not the same for the within-person analysis, it is still questionable if binge-watching leads to the consumption of eating more unhealthy snacks. Additionally, there are no known previous studies that explored the between- and within-person associations for binge-watching and (unhealthy) snacking, indicating that more research needs to be done.

Also, the eating behaviour of characters in series/movies might have an effect on the audience. In particular, it has been described that especially teenage girls or girls in transition phases, i.e. from college to adulthood, are influenced by the diet habits of other female characters (Kiernan, 2019). Research indicates that in series targeted at a young audience it is often shown how female characters skip meals, restrict from eating, eat in emotional situations or experience fat shaming for eating too much. As a consequence, prone individuals are more likely to develop an eating disorder (Kiernan, 2019). This tendency shows how binge-watching might result in the opposite direction of the investigated topic meaning that binge-watching can lead to eating less often snacks and changing diet habits instead of consuming more unhealthy snacks. Hence, this might be a potential explanation for the contrasting findings given the fact that the sample consisted mainly of young females that might be in the transition phase from college to work life.

Another possible explanation for the association between more watching and less often eaten snacks might be that individuals did not actually watch when they ate snacks. To be concrete, it was only asked to indicate snacks after dinnertime. This does not necessarily mean that all snacks were consumed while watching. It might be that individuals engaged mostly in other activities (e.g. meeting friends) while eating snacks. This would also explain why the within-

person effect described that individuals who watched more on one day, ate less snacks. However, this would contradict the finding that individuals who watched more consumed more unhealthy snacks.

Lastly, the variable emotional stability was included to explore whether this character trait moderated the relation between binge-watching and snacking behaviour since it was argued by researchers that emotional stability can affect the general eating behaviour of individuals (Adriaanse et al., 2011; Levitan & Davis, 2010). However, literature did not specifically examine emotional stability as a potential moderator meaning that individuals with less emotional stability are more likely to eat unhealthy snacks during binge-watching sessions. Hence, this study aimed to explore this moderator relation.

The analysis revealed that emotional stability did not significantly moderate the relation between binge-watching and snacking intake or unhealthy snacking. Nevertheless, the analysis found that emotional stability had a significant main effect on unhealthy snacks whereas this result was not found for the relation with snacks in general. This suggested that emotional stability did not affect general snacks but being less emotionally stable significantly predicted consuming more unhealthy snacks over two weeks. Previous studies confirmed the finding that emotional stability might be a direct predictor of unhealthy snacking. For instance, David and Levitan (2010) explained that eating behaviour is often emotion-driven, suggesting that emotional eaters are more likely to consume unhealthy snacks. Another study showed that women and younger people are more likely to respond with unhealthy snacking behaviour while coping with negative emotions (Verhoeven et al., 2015). Since this study consisted mostly of young females, it might be that this can explain the finding of having emotional stability as a direct predictor of unhealthy snacking. Coumans et al. (2018) also argued that emotion-driven impulsiveness affects the food type, leading to eating more snacks that are high in energy intake. Given literature also support the finding that emotional stability might directly affect unhealthy snacking.

Although the study had findings contrasting to published studies, the study had several strong points that differentiate it from published studies. Firstly, the current study did not have a cross-sectional design as most studies that were described. The Experience Sampling Method enabled the investigation of the relation over time and gives more insights than a mere relation at one point in time. Especially the exploration given by the types of association-levels revealed deeper insights. Besides, the response rates were very high. Around 81% of the participants answered more than 80% of the questionnaires. In comparison, a literature review, analysing ten ESM studies, found that the average response rate was 78% (Rintala et al., 2019). Hence,

the current study had even slightly higher response rates than the average ESM study. It can be assumed that the response rates were high due to relatively low burden for participants. Often, participants of ESM studies have a short time period for answering a particular questionnaire and, mostly, there are several questionnaires per day. This study tried to increase the likelihood of answering the questionnaires by having only two questionnaires per day with several hours to answer the questions. Apparently, this might lead to high response rates. Moreover, the sample was relatively large with initially 81 participants since ESM normally has smaller samples. Van Berkel et al. (2017) argued that the average ESM study has 53 participants. Additionally, the questionnaire for emotional stability had a desirable high internal consistency, i.e. an alpha of .869. Besides, it was possible to have real-life data meaning that participants were in their natural environment increasing ecological validity by self-reporting behaviours and feelings. Memory bias could also be minimised by the daily questionnaires.

In contrast to the strong points, the findings might be affected by the choice of answer categories. Firstly, the questions focusing on watching behaviour could have been more elaborated by having either clearer categories for watching time or letting the participants themselves indicate their watching time manually. In this way, it would have been possible to have more precise values rather than mere categories of watching times. Next to the watching behaviour categories, the question focusing on types of snacks included the option 'Other'. However, it was not objectively possible to code that category into healthy or unhealthy snacks. Hence, subjective coding based on individual's previous snacking behaviour was necessary. Due to the uncertainties, this might have affected the results. Still, this happened seldom, assuming that it did not have a huge effect. In a follow-up study, it would be advisable to give participants the option to manually mention a snack if the snack type is missing as category.

Despite the benefits of experience sampling, some points showed the drawback. Firstly, it must be mentioned that the extensive study design can be more demanding than cross-sectional surveys for participants. For instance, despite the high response rates, less questionnaires were answered at the end of the two-week period. Additionally, the monitoring of behaviours and feelings might act as an intervention itself despite the observational character of the study. For instance, by being aware of one's own behaviour, participants might try to reduce their watching behaviour. It might also be that participants felt exposed by the daily questionnaires focusing on personal behaviour despite the anonymity. Besides, it might have been the case that individuals had difficulties answering questions regarding their snacking and watching behaviour of the last day, meaning that memory bias was prevalent.

Another limitation might be that emotional stability was only measured once as it was assumed that personality traits are relatively stable over time (Baumeister & Twenge, 2001). However, literature showed that out of the Big Five of personality traits, emotional stability is the least stable over time. In particular, it was discussed that emotional stability increases from young adulthood to middle adulthood and afterwards, decreases again when individuals become older (Specht, 2017). Still, it can be argued that emotional stability might not fluctuate much over a course of two weeks. In contrast, it could also be that emotional stability is affected by experienced situations per day meaning that emotional stability is rather a state than a stable trait. For instance, Brose et al. (2013) suggested that young adults, as in the used sample, are more likely to be affected by everyday stressors opposed to older adults. This indicates that emotional stability might vary more across younger individuals. On the other hand, another study found that adolescents would already have stable emotions when experiencing everyday stressors (Larson et al., 2003). Hence, the contrasting findings from literature show that there is more research needed to assess whether emotional stability is stable over time instead of having fluctuations per day.

Another cause for the contradicting findings might be that the chosen definition of binge-watching affected the results since research does not have a clear conceptualisation of binge-watching. To indicate binge-watching, two or more hours of watching and three or more episodes were used as the cut-off point as Rubenking and Bracken (2018) did. In contrast to literature, this cut-off is relatively high. For instance, Ahmed (2017) used the definition of watching more than one episode in one setting and Anozie (2020) described binge-watching as watching several episodes at one point in time. Only a few researchers used a definition that combined hours and episodes watched. Flayelle (2020) stressed that most researchers solely focused on episodes or rarely on hours, whereas both measures were seldom combined for a definition. Thus, due to the stricter definition and the missing general conceptualisation, it might be that the findings did not support previous results. Granow et al. (2018), on the other hand, defined binge-watching not as a universal cut-off point applicable for all watchers but focused on the self-perception of frequency of the consumption. This might be a way to avoid the need of finding a universal definition whereas it might also be that users cannot objectively evaluate their own watching behaviour due to biases, i.e. self-perception bias.

As a suggestion for future research, it might be interesting to further analyse the relation between snacking and binge-watching since this study had results contradicting previous literature. Additionally, it might be possible to analyse snacking and VoD-watching (e.g. hours or episodes) solely as continuous measures without focusing on binge-watching to investigate

whether this changes the results. Moreover, the significant effect of emotional stability on snacking behaviour could be further studied to confirm the finding. Additionally, it might be the case that a model with another moderator variable could explain the association between binge-watching and snacking behaviour better. Based on literature, some relevant variables might be self-efficacy, stress, sociodemographic background, habit strength or the intake of breakfast (Gore et al., 2003; Mithra et al., 2018; Verhoeven et al., 2012). Researchers found that less self-efficacy, more stress, a weak sociodemographic background, low habit strength and skipping breakfast might lead to more unhealthy snacks.

Moreover, a study indicated that the genre of the series watched might affect snacking behaviour (Mattar et al., 2014). It was suggested that various genres did not affect hunger directly. Instead, it was described that individuals watching a horror movie are more likely to crave salty snacks, whereas individuals watching a romantic movie are more likely to choose sweet snacks. In a follow-up study, it might be interesting to further study this tendency. For instance, the association between several genres such as comedy, drama or action, and snacking could be investigated.

Overall, the study might cast doubts on previous studies in suggesting that unhealthy snacking might not be directly associated with heavy watching behaviour. Generally, it was predicted that uncontrolled snacking is associated with watching times, which in turn might have severe effects on human health resulting in various diseases (e.g. diabetes, overweight or heart diseases). Opposed, it might be that binge-watching is currently over-pathologised, meaning that too drastic consequences are assumed. Nevertheless, the topic should be further analysed to be more certain about the outcomes. Specifically, it must be further explored to what extent the association with health outcomes at the between- and within-person levels differ since there is missing research. To sum up, this study did not support the findings of previous studies. Still, the topic of binge-watching needs more research due to being an increasingly dominant behaviour of people in the digital age, which is even expected to turn into the average form of watching behaviour.

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# 6. Appendices

## 6.1 Appendix A

### The first e-mail participants received including important information and the registration code

Dear Participant,

Thank you very much for taking your time and supporting us with our bachelor thesis study! We will tell you everything you need to know before you can get started.

Overall, the aim of the study is to have a look at video-on-demand (VOD) watching behaviour and (mental) health-related concepts. With the help of our questionnaires, we would like to gain more insights into your viewing behaviour over the next 14 days.

As of today, we would kindly like to ask you to download the **Ethica Data** app for either your Android or IOS smartphone. You will use this app on a daily basis to answer our little questionnaires and help us gather data.

Once you downloaded the app and created an account with your mail address, you can click on **Join Study** and enter the following code:

**1712**

And just like that you are part of our research!

To get started we would like to ask you to read our consent form and indicate whether you like to participate or not. After that you are done for today! **Tomorrow** you will receive your **first two questionnaires**, remember that these might take a little bit longer as these are baseline questionnaires. You probably will need 10 – 15mins to answer them. **After that**, you will receive a morning and an evening questionnaire for the next 14 days. These questionnaires are really short and will take you approximately 3mins in total to complete.

That is all you need to know! We would like to thank you again and wish you a lot of fun answering the questions.

Maybe you can even find out more about yourself!

Your dedicated psychology researchers,

Christina, Naomi, Lara, Annika, Celine and Jeremy

## 6.2 Appendix B

### The informed consent

Welcome to our study about video-on-demand (VOD) watching behaviour!

Thank you for your time and support! Please read the following information carefully.

The aim of this research is to explore the relation between VOD watching and (mental) health-related variables. With your participation in this research you will help to make a contribution to the scientific knowledge of VOD watching behaviour.

You can participate in this study if you are at least 16 years old and proficient in English. Ethica is used over a 14-dayperiod to respond to short questionnaires on a daily basis. Please make sure that the notifications on your device for the application (Ethica) are turned on. This facilitates you to answer the questions in the pre-determined time frame.

At the start of the study, you will be asked to fill out a baseline questionnaire with questions about demographics, and personality traits. This questionnaire will take around 10 minutes to fill out. From the 8$^{th}$ of April, you will be asked to fill out a short questionnaire twice a day. The questionnaire will be around 5 minutes and the questions asked are about your mood, behaviour and feelings.

This research is not expected to pose any risks. One side effect that can occur is that you might be more aware of your daily mood, behaviour, and feelings. The participation in this study is voluntary. If you wish to withdraw from this research, you can do so at any time without giving a reason.

All your answers will be treated confidentially. Therefore, all personal data (e.g., e-mail, age, gender, etcetera) will be anonymized and will not be published and/or given to a third party.

The study has been approved by the Ethics Committee of the University of Twente, and is thus compliant with internationally recognised guidelines on ethical research.

If any questions or concerns arise before, during or after your participation, do not hesitate to contact the researchers:

Christina Ernsting (c.ernsting@student.utwente.nl)

Jeremy Hanhoff

Celine Mezielis

Naomi Nitsche

Lara Schwerdtner

I have fully read and understand the text above and I am willing to participate in this study.

## 6.3 Appendix C

### The items of the baseline questionnaire

+keyed Am relaxed most of the time.

Seldom feel blue.

-keyed Get stressed out easily.

Worry about things.

Am easily disturbed.

Get upset easily.

Change my mood a lot.

Have frequent mood swings.

Get irritated easily.

Often feel blue.

## 6.4 Appendix D

The relevant items focusing on video-on-demand watching

How **long** did you watch VOD services **yesterday**?

(If you did not watch a full hour, please just round up/off - e.g., if you watched more than 1 hour and 30 minutes please indicate 2 hours)

- ○ I did not watch
- ○ Less than 1 hour
- ○ 1 hour
- ○ 2 hours
- ○ 3 hours
- ○ 4 hours
- ○ 5 hours
- ○ More than 5 hours

How many **episodes** did you watch **yesterday**? (please set the number to 0 if you did not watch any episodes and please count all movies/documentaries you watched also as episodes)

At what **time** did you start watching video-on-demand content **yesterday**?

(Multiple answers possible)

- ☐ Morning (6 a.m. - 12 p.m.)
- ☐ Afternoon (12 p.m. - 6 p.m.)
- ☐ Evening (6 p.m. - 11 p.m.)
- ☐ Night (11 p.m. - 6 a.m.)
- ☐ I did not watch VOD services

## 6.5 Appendix E

The items concerning the snacking behaviour of the participants